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SignalPath™ 201-SA (SP201-SA™) Installation Guide

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SignalPath Software Version 1100

This *Installation Guide* presents a quick, standard installation of the SP201-SA.

Note: The needs of your network may require an installation that varies from the standard installation. For a customized installation, see the *SP201-SA Customization and Maintenance Guide*. For hardware information, see the *SP201-SA Hardware Reference Guide*.

The SP201-SA is available in two versions:

- The two-port SP201-SA, supporting one trunk circuit of up to 30 channel circuits
- The four-port SP201-SA, supporting up to two trunk circuits of up to 30 channel circuits each (for a total of up to 60 channel circuits)

Note: A standard trunk circuit (from one external device, through the SP201-SA, to another external device) comprises trunk connections to two ports. The SignalPath™ configuration software defines each side of the trunk circuit (that is, each connection to a port) as a trunk.

This document uses the term *trunk* to indicate a connection to one port; it uses the term *trunk circuit* to indicate the complete end-to-end connection (over two ports). Using these definitions, a trunk circuit comprises two trunks.

Before you start this installation, be sure you have filled out the worksheet for adding this device to your network. See the *SP201-SA Site Planning Worksheet*.

See the following sections for a standard installation of the SP201-SA:

- Section A, *Physical Installation*
- Section B, *Port Configuration*
- Section C, *Clocking Configuration*
- Section D, *Trunk Configuration*
- Section E, *Channel Configuration*
- Section F, *SP201-SA Warmstart*

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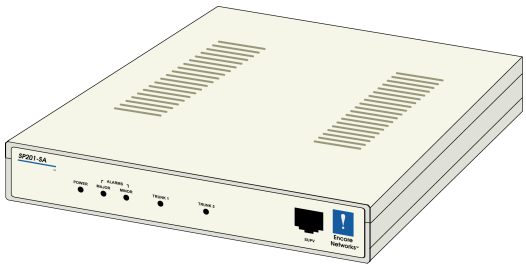

Figure 1. SP201-SA Chassis

Note: The cables you connect to the SP201-SA depend on the protocols. The following table lists the ports and line each protocol uses in this guide's standard installation.

Protocol Group	Protocol	Port on Two-Port SP201-SA	Ports on Four-Port SP201-SA	Line
Channel-Associated Signaling (CAS)	DTMF	1	1, 2	T1
	R1	1	1, 2	T1
	R2	1	1, 2	E1
ISDN	ETSI ISDN	2	3, 4	E1
	NI2 ISDN	2	3, 4	T1

A Physical Installation

1. Place the SP201-SA on a tabletop or shelf.
2. Connect the cables for one set of trunks to the ports on the rear of the SP201-SA chassis, as follows:

   a For the CAS trunk (DTMF, R1, R2, or N5), do one of the following:

   - For DTMF or R1, connect a T1 cable to the RJ48C port labeled **Port 1**.

     or

   - For R2 or N5, connect an E1 cable in one of the following ways:
     - Connect an E1 cable to the RJ48C port labeled **Port 1**.

       or

     - Connect an E1 cable to the BNC **Rx** and **Tx** ports labeled **Port 1**.

   b For the ISDN trunk, do one of the following:

   - For ETSI ISDN on a two-port SP201-SA, connect an E1 cable to the RJ48C port labeled **Port 2**. (For ETSI ISDN on a four-port SP201-SA, connect an E1 cable to the RJ48C port labeled **Port 3**.)

     or

   - For NI2 ISDN on a two-port SP201-SA, connect a T1 cable to the RJ48C port labeled **Port 2**. (For NI2 ISDN on a four-port SP201-SA, connect a T1 cable to the RJ48C port labeled **Port 3**.)

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Note: Channels on trunk 1 of the two-port SP201-SA map to channels on trunk 2, and vice versa.

In a standard installation of the four-port SP201-SA, channels on trunk 1 map to channels on trunk 3 (and vice versa), and channels on trunk 2 map to channels on trunk 4 (and vice versa).

3. If you are installing a four-port SP201-SA, connect another set of trunks to ports on the rear of the chassis, as follows:

   a For the CAS trunk (DTMF, R1, or R2), do one of the following:

   - For DTMF or R1, connect a T1 cable to the RJ48C port labeled **Port 2**.

     or

   - For R2, connect an E1 cable to the RJ48C port labeled **Port 2**.

   b For the ISDN trunk, do one of the following:

   - For ETSI ISDN, connect an E1 cable to the RJ48C port labeled **Port 4**.

     or

   - For NI2 ISDN, connect a T1 cable to the RJ48C port labeled **Port 4**.

4. Connect the SP201-SA to its external power supply. Then connect the power supply to a power source (a power outlet), and switch the power on.

   Note: Shipments within North America include a power cable for connection to the power outlet. For shipments outside North America, contact your distributor for a cable that meets local requirements to connect the power supply to an outlet.

5. Connect an RJ45 cable from the RJ45 Supervisory port of the SP201-SA to the DB9 COM port of a control terminal—for example, a PC. (An RJ45-to-DB9 adapter is included with the cable.)

6. On the control terminal, start a terminal emulation program, such as HyperTerminal. Configure the serial communications for the control terminal as follows:

Baud rate	9600 bps
Data bits	8
Parity	None
Stop bit	1
Flow control	None

   ❖ When communication has been established, you should see the `user>` prompt.

7. If you don't see a prompt, press **Enter** once.

   ❖ The `user>` prompt appears.

   Note: After you have connected a local terminal to the SP201-SA device, you can connect a remote terminal to the local terminal and manage the device from a remote location. See the document *Remote Access to SignalPath™ Devices*.

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B Port Configuration

What the terminal displays	What you type	What you are configuring
`user>`	**`config lim`**	Interfaces for the SP201-SA's ports

`List of Valid LIMs`
 	
`1) 1 E1 120 Ohm/1 E1 120 Ohm`
`2) 2 T1 100 Ohm/1 E1 120 Ohm`
`3) 1 T1 100 Ohm/1 T1 100 Ohm`
`4) 2 T1 100 Ohm/2 T1 100 Ohm`
`5) 1 E1 120 Ohm/1 T1 100 Ohm`
`6) 1 E1 120 Ohm/2 T1 100 Ohm`
`7) 1 T1 100 Ohm/1 E1 75 Ohm`
`8) 1 T1 100 Ohm/1 E1 120 Ohm`
`9) 1 E1 75 Ohm/1 T1 100 Ohm`
`10) 1 E1 75 Ohm/1 E1 75 Ohm`
`> 11) 1 E1 75 Ohm/1 E1 120 Ohm <`
`12) 1 E1 120 Ohm/1 E1 75 Ohm`
`13) 2 T1 100 Ohm/2 E1 75 Ohm`
`14) 2 T1 100 Ohm/2 E1 120 Ohm`
`15) 2 E1 75 Ohm/2 T1 100 Ohm`
`16) 2 E1 75 Ohm/2 E1 75 Ohm`
`17) 2 E1 75 Ohm/2 E1 120 Ohm`
`18) 2 E1 120 Ohm/2 T1 100 Ohm`
`19) 2 E1 120 Ohm/2 E1 75 Ohm`
`20) 2 E1 120 Ohm/2 E1 120 Ohm`
 	
`Enter LIM Choice from list above`
`[1-20] (current=11) ==>`		

*Select the configuration that supports your SP201-SA's port connections, and press the **Enter** key. (The List of Valid LIMs shown is for a four-port SP201-SA.)* **Note:** *The standard choices shown below, in **boldfaced** numbers, include 120-ohm E1 interfaces. E1 interfaces may instead use 75 ohms over a BNC connector. If you use BNC connectors, choose an appropriate combination from the List of Valid LIMs above.* *Protocol Conversion* / *Interfaces* / 2-Port / 4-Port *DTMF–ETSI ISDN* / *T1/E1* / **8** / **14** *DTMF–NI2 ISDN* / *T1/T1* / **3** / **4** *R1–NI2 ISDN* / *T1/T1* / **3** / **4** *R2–ETSI ISDN* / *E1/E1* / **1** / **20** *R2–NI2 ISDN* / *E1/T1* / **5** / **18**		Ports 1 and 2/Ports 3 and 4

(A message similar to the following appears only if you change the LIM configuration.)
 	
`LIM set to: 2 E1 120 Ohm/2 E1 120 Ohm`
 	
`A coldstart is required for this change to take effect`
`Do you wish to reset now (y/n)?`
	`y` *(You must do this now, so that subsequent configuration parameters will reflect the SP201-SA's port configuration.)*	Implementation of port configuration

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What the terminal displays	What you type	What you are configuring
(Information on tests and restarts)		
(Boot banner and `boot>` prompt)	*(Do not type anything. The application will load in a few seconds.)*	
(Initializations)		
(Application banner and `user>` prompt)		(When you see the `user>` prompt, the SP201-SA is ready for further configuration.)

C Clocking Configuration

What the terminal displays	What you type	What you are configuring
`user>`	**`config clocks`**	Clocking (synchronization) for the SP201-SA

`Enter the trunk number [1-4] from which this card is to derive its clock source. Or enter "0" if this card is to use its internal clock.`
 	
`The PRIMARY clock source is derived from (current = INTERNALCLOCK):`
	`1`	Clock sourced from the device connected to the remote end of the R2 trunk

`The SECONDARY clock source is derived from (current = INTERNALCLOCK):`	**`0`**	Backup clock sourced from the SP201-SA
`user>`		(Clocking has been configured.)

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D Trunk Configuration

Perform the following procedure once for each trunk on the SP201-SA.

What the terminal displays	What you type	What you are configuring
`user>`	**`config framer`** ***p*** *where p is the port number (1, 2, 3, or 4)*	Trunk on port *p*
`WARNING: Configuring framers will cause LOSS of calls!!!!!!!! Do you wish to proceed anyway (Y/N) :`	**`y`**	

For a T1 line:
`LIM type: 2 T1 100 Ohm/2 E1 120 Ohm`
`1 D4 SF`
`2 D4 ESF`
`enter T1 frame type (currently D4 SF):`
For an E1 line:
`LIM type: 2 E1 120 Ohm/2 E1 120 Ohm`
`1 G704 CRC`
`2 G704 noCRC`
`3 G704 MF CRC`
`4 G704 MF noCRC`
`enter E1 frame type (currently G704 MF no CRC):`
	For T1 lines: ***1*** *or your T1 frame type)*
	For E1 lines: ***3*** *(or your E1 frame type)*
		Frame type for trunk

For T1 lines:
`line coding type choices are:`
`1 AMI`
`2 B8ZS`
`enter line coding type (currently B8ZS) :`
For E1 lines:
`line coding type choices are:`
`1 AMI`
`2 HDB3`
`enter line coding type (currently HDB3) :`
	For T1 lines: ***2*** *(or your T1 line coding)*
	For E1 lines: ***2*** *(or your E1 line coding)*
		Line coding for trunk

For T1 lines:
`line length choices are:`
`1 0 to 115 feet`
`2 82 to 213 feet`
`3 180 to 312 feet`
`4 279 to 410 feet`
`5 377 to 509 feet`
`6 476 to 607 feet`
`7 574 to 689 feet`
`enter line length (currently 0-115 feet):`
	`1` *(or your T1 cable length)*	T1 cable length

`user >`		(The trunk has been configured.)

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E Channel Configuration

See the following sections to configure the protocols in your SP201-SA:

- DTMF signaling — Section E.1, *Channel Configuration for DTMF Signaling*
- R1 signaling — Section E.2, *Channel Configuration for R1 Signaling*
- R2 signaling — Section E.3, *Channel Configuration for R2 Signaling*
- N5 signaling — Section E.4, *Channel Configuration for N5 Signaling*
- ETSI ISDN signaling — Section E.5, *Channel Configuration for ETSI ISDN*
- NI2 ISDN signaling — Section E.6, *Channel Configuration for NI2 ISDN*

E.1 Channel Configuration for DTMF Signaling

What the terminal displays	What you type	What you are configuring
`user>`	**`config dt all`**	All DTMF channels
`Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>`	**`n`**	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
`DTMF Caller ID/ANI used? (y or n) : <current=n>`	**`y`** *(or* **`n`** *if caller ID is not required)*	Request for caller identification
`Other modifications? : (y or n) : <current=n>`	**`n`**	Completion of standard configuration for DTMF signaling (If you wish to configure other parameters for DTMF signaling, type **`y`**. Then refer to the *SP201-SA Customization and Maintenance Guide*.)
`user>`		(DTMF signaling has been configured.)

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E.2 Channel Configuration for R1 Signaling

What the terminal displays	What you type	What you are configuring
`user>`	**`config r1 all`**	All R1 channels
`Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>`	**`n`**	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
`Template # for default IAM ? : (range 1 - 5) : <current=1>`	**`1`**	Use of R1 IAM template 1
`Template # for default ACM ? : (range 1 - 5) : <current=1`	**`1`**	Use of R1 ACM template 1
`Include Feature Group D (caller ID/ ANI)? (y or n) : <current=n>`	**`y`** *(or* **`n`** *if caller ID is not required)*	Request for caller identification
(The following four questions appear only if you answered **y** *to the previous question.)* `Use 911-Operator Services Signaling (y or n) : <current=n>`	**`n`**	No use of 911 support
`Max nbr of ANI digits to send R1 (0 = all) ? : (range 0 - 32) : <current=0>`	**`0`** *(zero)*	Support for ANI of any size
`Are Information digits supported? (y or n) : <current=n>`	**`n`**	No support of Information digits
`Separate Wink required for B-Party Number? (y or n) : <current=n>`	**`n`**	No separate wink for B-Party
`Require wink at end of selection? (y or n) : <current=n>`	**`n`**	No wink required at end of selection
`Generate ringback tone for R1 originated calls? (y or n) : <current=n>`	**`n`**	No ringback generated for caller
`user>`		(Standard configuration for R1 signaling has been completed. If you wish to configure other parameters for R1 signaling, refer to the *SP201-SA Customization and Maintenance Guide*.)

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E.3 Channel Configuration for R2 Signaling

What the terminal displays	What you type	What you are configuring
`user>`	**`config r2 all`**	All R2 channels
`Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>`	**`n`**	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service

```
Select R2 converter mode :

< 1> CCITT                      <14>Israel
< 2> Argentina                  <15>Korea
< 3> Brazil                     <16>Kuwait
< 4> Brazil-Emb                 <17>Malaysia
< 5> Chile                      <18>Mexico
< 6> China                      <19>New Zealand
< 7> Columbia                   <20>Paraguay
< 8> Columbia-Bts               <21>Philippines
< 9> Columbia-Ngt               <22>Singapore
<10> Costa Rica                 <23>Thailand
<11> Ecuador                    <24>Uruguay
<12> Greece                     <25>Venezuela
<13> Indonesia
```

`Outgoing R2 converter mode? (1-25; current=CCITT) :`	**`1`** *(or your country code)*	The country code for the version of R2 signaling this *SP201-SA* will use
`Request R2 caller ID? (y or n) : <current=n>`	**`y`** *(or* **`n`** *if caller ID is not required)*	Request for caller identification
`Send I15 to R2 side at end of address (vs timeout)? (y or n) : <current=y>`	**`y`** *(or* **`n`***, depending on your requirement)*	Sending an Address Complete code (An answer of **`n`** causes the adjacent switch to wait for the appropriate timer to expire before processing the call.)
`Other modifications? : (y or n) : <current=n>`	**`n`**	Completion of standard configuration for R2 signaling (If you wish to configure other parameters for R2 signaling, type **`y`**. Then refer to the *SP201-SA Customization and Maintenance Guide*.)
`user>`		(R2 signaling has been configured.)

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E.4 Channel Configuration for N5 Signaling

What the terminal displays	What you type	What you are configuring
`user>`	**`config n5 all`**	All N5 channels
`Set 1/1 thru 2/31 out-of-service? (y or n) : <current=n>`	**n**	Placement of channels 1–31 of trunk 1 and (on the four-port SP201-SA) channels 1–31 of trunk 2 into service
`Destination country code for calls to N5 (current) : Enter up to 3 digits:`	*(your country code)*	Your country's international dialing code
`Transit calls to N5 enabled ? (y or n) : <current=n>`	**n**	Disallowance of transit traffic
`Use Calling Party Category to set N5 language digit? (y or n) : <current=n>`	**n**	No use of the calling party category to derive the language digit
`N5 side outgoing language digit (current) : Enter up to 1 digits:`	*(Press* **Enter** *to leave this field empty.)*	The fixed language digit for calls originating from the N5 side
`Prefix to be stripped from digits before sending to N5 (current) : Enter up to 3 digits:`	*(Press* **Enter** *to leave this field empty.)*	Digits to remove from the front of the country code
`Digits that cause C11 to be sent to N5 (current) : Enter up to 18 digits:`	*(Press* **Enter** *to leave this field empty.)*	Digit string that causes the C11 operator code to be sent to N5
`Digits that cause C12 to be sent to N5 (current) : Enter up to 18 digits:`	*(Press* **Enter** *to leave this field empty.)*	Digit string that causes the C12 operator code to be sent to N5
`Language digit expected from N5 [* = any] (current) : Enter up to 1 digits:`	*(Press* **Enter** *to leave this field empty.)*	Acceptance of calls only with a specific language digit (if entered)
`Transit calls FROM N5 enabled ? (y or n) : <current=n>`	**n**	Rejection of transit calls (by returning a busy flash)
`Digits to prepend in non-transit calls coming from N5 (current) : Enter up to 3 digits:`	*(Press* **Enter** *to leave this field empty.)*	Digits to prepend to non-transit calls
`Use calling party category from template ? (y or n) : <current=n>`	**n**	Derivation of the Calling Party Category from the N5 language digit
`Digits to send when C11 is received from N5 (current) : Enter up to 18 digits:`	*(Press* **Enter** *to leave this field empty.)*	The digit string to send when the C11 operator code is received from N5
`Digits to send when C12 is received from N5 (current) : Enter up to 18 digits:`	*(Press* **Enter** *to leave this field empty.)*	The digit string to send when the C12 operator code is received from N5

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What the terminal displays	What you type	What you are configuring
`Template # for default IAM ? : (range 1 - 5) : <current=1>`	**1**	Default values for IAM parameters required on the SS7 side but not specified by the N5 protocol
`Template # for default ACM ? : (range 1 - 5) : <current=1>`	**1**	Default values for ACM parameters required on the SS7 side but not specified by the N5 protocol
`Use user-defined caller ID (ANI) in calls from N5? (y or n) : <current=n>`	**n**	No support of caller ID (ANI). **Note:** Although N5 does not use ANI, some networks require ANI in all calls. Answering **y** here places a fixed ANI in each call originating from N5.
`Generate ringback tone for N5 originated calls? (y or n) : <current=n>`	**n**	No ringback generation by SignalPath for calls from N5 device
`user>`		(This completes standard configuration of N5 signaling. If you wish to customize the configuration of N5 signaling, refer to the *SP201-SA Customization and Maintenance Guide*.)

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E.5 Channel Configuration for ETSI ISDN

In the two-port SP201-SA, perform the following procedure once for trunk 2. In the four-port SP201-SA, perform the procedure once each for trunks 3 and 4.

Note: If you are performing this procedure on a two-port SP201-SA, read trunk 3 as trunk 2.

What the terminal displays	What you type	What you are configuring
`user>`	**`config dchans`**	ISDN signaling channel

`The following is the present Trunk configuration.`
`If a change to the Timeslot or Interface Type is desired`
`Enter the Trunk number you wish to modify or exit:`
 	
`Trunk Signaling Type Timeslot Trunk Type Link State Interface Type Protocol`
`---`
`3 D 16 E1 Inactive Network ETSI ISDN`
`4 D 16 E1 Inactive Network ETSI ISDN`		

`ISDN Trunk Number`
 	
`Enter value(3 - 4) or "exit" :`
	p
	where p is the port number (3 or 4)
		ISDN trunk *p*

`Select interface type - user(0) or network(1) : <current=1>`	**`1`** *(or* **`0`***)*	*SP201-SA* as the Network role *(or as the User role)* in this ISDN connection

`ISDN Interface number 1 assigned to Trunk p,`
`with a D Channel on timeslot 16.`
 	
`Change ISDN Signaling Channel`
 	
`Enter value(1 - 31; current="16") or "exit" :`
	`16`	Signaling timeslot

(The following message appears only if you change the channel number used as the signaling timeslot.)
 	
`Changes applied`
 	
`The card must be reset for the changes to operate properly`
`Do you wish to reset now (y/n)?`
	`n`	Delay in implementation of changes until performing a warmstart (described in Section F, *SP201-SA Warmstart*)

`not resetting...`
 	
`user>`
		(ISDN signaling has been configured on this trunk.)

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E.6 Channel Configuration for NI2 ISDN

In the two-port SP201-SA, perform the following procedure once for trunk 2. In the four-port SP201-SA, perform the procedure once each for trunks 3 and 4.

Note: If you are performing this procedure on a two-port SP201-SA, read trunk 3 as trunk 2.

What the terminal displays	What you type	What you are configuring
`user>`	**`config dchans`**	ISDN signaling channel

`The following is the present Trunk configuration.`
`If a change to the Timeslot or Interface Type is desired`
`Enter the Trunk number you wish to modify or exit:`
 	
`Trunk Signaling Type Timeslot Trunk Type Link State Interface Type Protocol`
`---`
`3 D 24 T1 Inactive Network NI2 ISDN`
`4 D 24 T1 Inactive Network NI2 ISDN`		

`ISDN Trunk Number`
 	
`Enter value(3 - 4) or "exit" :`
	p
	where p is the port number (3 or 4)
		ISDN trunk *p*

`Select interface type - user(0) or network(1) : <current=1>`	**`1`** *(or* **`0`***)*	*SP201-SA* as the Network role *(or as the User role)* in this ISDN connection

`ISDN Interface number 1 assigned to Trunk p,`
`with a D Channel on timeslot 24.`
 	
`Change ISDN Signaling Channel`
 	
`Enter value(1 - 31; current="24") or "exit" :`
	`24`	Signaling timeslot

(The following message appears only if you change the channel number used as the signaling timeslot.)
 	
`Changes applied`
 	
`The card must be reset for the changes to operate properly`
`Do you wish to reset now (y/n)?`
	`n`	Delay in implementation of changes until performing a warmstart (described in Section F, *SP201-SA Warmstart*)

`not resetting...`
 	
`user>`
		(ISDN signaling has been configured on this trunk.)

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F SP201-SA Warmstart

What the terminal displays	What you type	What you are configuring
`user>`	**`warmstart`**	Implementation of the ISDN configuration
`This action will drop any calls that are in progress.` `Do you really want to continue? (y/n):`	**`y`**	

(Information on tests and restarts)
 	
(Boot banner)
 	
`boot>`
 	
(Initializations)
 	
(Application banner)
 	
`user>`
	(Do not type anything. The application will load in a few seconds.)	(When you see the `user>` prompt, the *SP201-SA* is ready for use.)

This completes the standard installation. To configure other parameters, see the *SP201-SA Customization and Maintenance Guide*. For hardware specifications, see the *SP201-SA Hardware Reference Guide*.

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